

areas of round-cell infiltration are found around slightly damaged glomeruli. No changes can be observed in the walls of the blood vessels, and there are no areas of calcification.

**PROTOCOL 2—Guinea-pig 24.**—Fifty-one subcutaneous injections of 0.25 mg. of uranium nitrate were given during sixty-eight days, and the animal died on the sixty-eighth day. The weight decreased from 580 gm. to 415 gm. Albumin was present in the urine after the fourth, fourteenth and twenty-sixth doses for one day each time, after the thirty-second dose for three days, and after the forty-third dose for two days. There was almost complete anuria for the twenty-four hours preceding death, the small amount of urine excreted containing a high percentage of albumin. No convulsions were observed.

**Autopsy.**—The peritoneum was considerably congested and there was a small amount of clear fluid in the peritoneal cavity. The bladder contained about 5 c.c. of urine, which gave a definite reaction for albumin but contained no casts. The kidneys were rather large and pale, almost gray in color, with some dilated venules over the surface. There was no perinephric fat, and the capsule stripped easily. The cut surface bulged on section and showed some edema. The cortex was paler in color than the medulla.

#### MICROSCOPIC EXAMINATION

The condition found is similar to but more marked than that described in Protocol 1. There are a few definite areas of fibrosis which seem to replace the medullary rays, and which extend to and correspond with small dimples on the surface. Immediately on either side of these processes the greater part of the parenchymatous change is seen, the appearance of the cortex in other places being practically normal. The glomeruli show changes similar to those described in Protocol 1, but in addition, a few show newly formed elastic tissue fibers around the capsule, external to the thickened, hyaline basement membrane. The cystic formation is more marked and occurs both in the glomeruli and in the convoluted tubules, one cyst being found in the cortex which measured fully 1 mm. in diameter. The ascending limbs of Henle's loops contain greater numbers of desquamated cells but no dense hyaline casts. There are a few small foci of calcium deposit in the cortex and very definite deposit in the medulla.

**PROTOCOL 3—Guinea-pig 25.** (Figs. 1 and 2.)—Forty-six injections of 0.25 mg. were given in seventy-seven days, and the animal died on the seventy-seventh day. The weight dropped from 665 gm. to 410 gm. Albumin was present in the urine for two days after the fifth dose, and for two days before death. There was no noticeable tendency to anuria during the twenty-four hours preceding death, but numerous granular casts were found in the urine at this time.

**Autopsy.**—The peritoneum was markedly congested and firmly adherent to the abdominal wall in the region where the injections had been made. A very small quantity of fluid was found in the peritoneal cavity. The bladder was full of clear urine which gave a marked reaction for albumin and contained very many granular casts. The stomach and intestines were enormously distended and contained a large quantity of fluid material. The liver, heart, lungs and adrenals showed no gross change. The kidneys were very large, the left being larger than the right, and were dark in color and mottled. The capsule stripped easily. On section there was definite bulging and some edema, and the cortex and medulla were uniformly congested.